PVP 20

Code: 20CE3503

III B.Tech - I Semester – Regular / Supplementary Examinations
NOVEMBER 2023

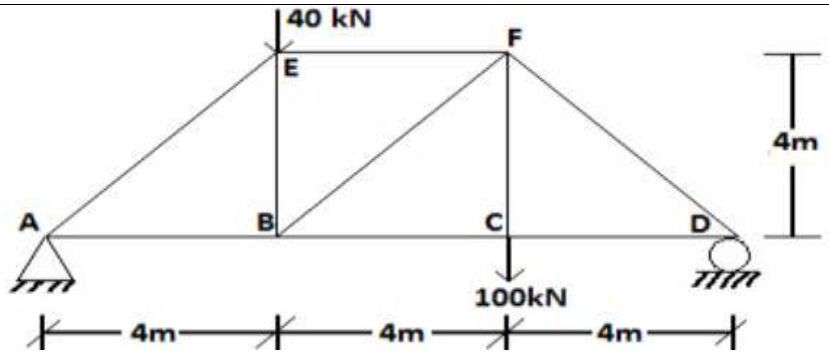
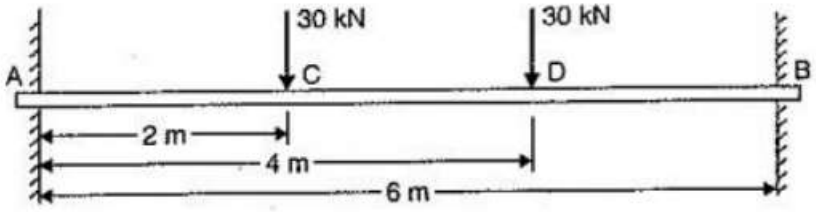
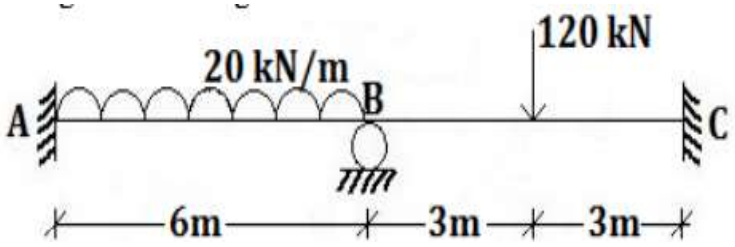
STRUCTURAL ANALYSIS
(CIVIL ENGINEERING)

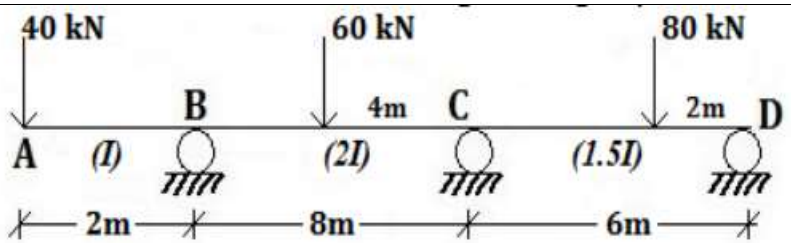
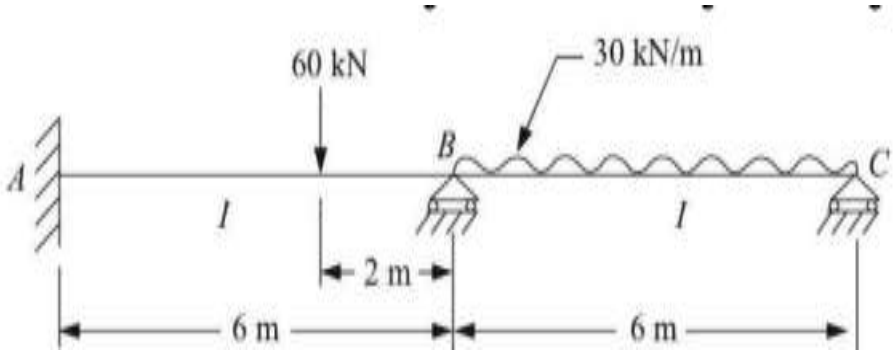
Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	A beam of uniform rectangular section 200 mm wide and 300 mm deep is simply supported at its ends. It carries a uniformly distributed load of 9 kN/m run over the entire span of 5 m. If the value of E for the beam material is 1 x 10^4 N/mm^2, find: (i) The slope at the supports and (ii) Maximum deflection.		L5	CO1	14 M
OR					
2	Determine the vertical deflection of the joint 'B' for the truss shown in the figure. Take the sectional area of each member as 1800 mm^2 and E = 200 kN/mm^2		L5	CO1	14 M

				
	UNIT-II			
3	A fixed beam of length 6 m carries two-point loads of 30 kN each at a distance of 2 m from both ends. Determine the fixed end moments and draw the B.M. diagram. 	L4	CO2	14 M
	OR			
4	Analyse the fixed continuous beam shown in the figure by Slope Deflection method and draw the bending moment diagrams. 	L4	CO2	14 M
	UNIT-III			
5	Analyse the continuous beam by Moment Distribution Method and draw the bending moment diagram.	L4	CO3	14 M

				
	OR			
6	Analyse the continuous beam shown in Figure and draw bending moment diagram by Kani's Method 	L4	CO3	14 M
	UNIT-IV			
7	A solid round bar 3 m long and 5 cm in diameter is used as a strut with both ends hinged. (Take E = 2.0 x 10^5 N/mm^2) Determine the crippling load, when the given strut is used with the following conditions: (i) One end of the strut is fixed and the other end is free (ii) Both the ends of strut are fixed (iii) One end is fixed and other is hinged.	L5	CO4	14 M
	OR			
8	A hollow circular column having external and internal diameters of 300 mm and 250 mm respectively carries a vertical load of 100 kN at the outer edge of the column. Calculate the maximum and minimum intensities of stress in the section.	L5	CO4	14 M

UNIT-V					
9	a)	Derive expression for circumferential stress in thin cylinder.	L2	CO5	7 M
	b)	A cylindrical pipe of diameter 1.5m and thickness 1.5cm is subjected to an internal fluid pressure of 1.2 N/mm^2. Determine: i) Longitudinal stress developed in the pipe, and ii) Circumferential stress developed in the pipe.	L5	CO5	7 M
OR					
10		A compound cylinder is made by shrinking a cylinder of external diameter 300 mm and internal diameter of 250 mm over another cylinder of external diameter 250 mm and internal diameter 200 mm. The radial pressure at the junction after shrinking is 8 N/mm^2. Find the final stresses set up across the section, when the compound cylinder is subjected to an internal fluid pressure of 84.5 N/mm^2.	L5	CO5	14 M